U.S. Department of Housing and Urban Development

TENANT RENTAL ASSISTANCE CERTIFICATION
Replacement SYSTEM

Integrated Multifamily Access eXchange (iMAX) Industry Specifications

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Change History

Date	Change Description
11/2008	iMAX initial implementation
4/30/2010	iMAX ROB implementation (available via the iMAX user interface - no impact to industry software)
10/1/2010	MAT edit, new ROB error, and error format

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1.0 INTRODUCTION

1.1 Scope

This document is written for Industry software vendors who will need to update their software to interact with the integrated Multifamily Access eXchange (iMAX) system.

1.2 Background

The integrated Multifamily Access eXchange (iMAX) system was designed and built as a replacement for the TRACSMail subsystem of Tenant Rental Assistant Certification System (TRACS). This encompassed enhancing the functionality of the TRACSMail subsystem and making use of more up-to-date technologies in order to achieve better user experience and system performance. The project was/is also in alignment with HUD's Enterprise Architecture Technical Reference Model, and Vision 2010.

iMAX is a web-based communication system with two forms of access, a graphical user interface and a system-to-system communication interface. The graphical user interface is accessible through the Web Access Secure Systems (WASS) gateway at HUD. The system-to-system communication interface is available for software vendors of Contract Administrators (CA), Owners, Management Agents, and Service Bureaus. The system-to-system communication interface provides the same set of functionality as the graphical user interface.

iMAX provides CAs, Owners, Management Agents, and Service Bureaus who have subsidy business with HUD a way to transmit tenant data and voucher data files to HUD and to other Owners, Management Agents, Service Bureaus, and CAs registered with iMAX. Files sent to HUD via iMAX are logged, processed, and queued for processing by iMAT. iMAT, an application running on a java application server, periodically pulls the queued MAT files from iMAX and performs the MAT Edit process (format validation) on the files. Data from files that pass the format validation is stored in MAT tables (DB2) on the mainframe to be processed by the Tenant Rental Assistance Certification System (TRACS) tenant and voucher cycles and, ultimately, stored in production tables (DB2). Any “failed” validation checks that cause a record to be rejected during the format validation will add records to response files which are sent back to Industry via iMAX.

1.3 iMAX Overview

The enhanced iMAX system will continue the existing functionality of the current iMAX system, allowing the users to send files to TRACS or other iMAX users and to receive files from TRACS and other iMAX users.

October 2010 Release

In addition, other changes that could impact the industry are the automation of Systems' Rules of Behavior acceptance functionality, which must be accepted via the user interface. If the user with the WASS ID used in a system-to-system transmission of a file has not accepted the ROB by October 1, 2010, the file will be rejected with a new error code. Moreover, the format of the new MAT error files will be changed to enhance readability.

The enhancements with a possible impact to the industry will include:

- Adding Rules of Behavior acceptance functionality.
- Modernizing the technology utilized by the MAT edit functionality.
- Perform MAT edits before passing the data to the TRACS system for Tenant and Voucher processing.
- Returning error messages to the Industry when an edit fails more timely (at least every two hours.)

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Users of iMAX will have two means of access to the system: interactively through a web browser, or systematically through web service calls.

Users accessing iMAX through the web browser will need to login and authenticate through HUD's **W**eb **A**ccess **S**ecure **S**ystems (**WASS**) Single Sign on.

April 2010 Release (No Impact to Industry Software)

Before continuing to the iMAX system via the user interface, users will have to accept the TRACS Rules of Behavior (ROB) if they have not done so within a year.

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Once logged in and authenticated, users would need to provide their TRACSMail/iMAX user ID and password. Users would then be able to upload a file(s) to TRACS or other iMAX users, view and/or download responses from TRACS or other iMAX users, or view files sent to TRACS or other iMAX users. Additionally, users can manage their TRACSMail/iMAX user ID profile through the web browser.

Users accessing iMAX through the web services will require their software system to make calls to iMAX through the web services. The calls will require the software system to provide a WASS user ID and password as well as a TRACSMail/iMAX user ID and password. Then there will be specific calls for the software systems to upload file(s) to TRACS or other iMAX users, receive a list or download files from TRACS or other iMAX users, and to receive a list of files sent to TRACS or other iMAX users.

Note: starting on October 1, 2010, users accessing iMAX via the web services will have to first log on to the web browser to accept the TRACS Rules of Behavior (ROB) before uploading file(s) to TRACS or other iMAX users (or must have done so within the last year), otherwise they will receive an error.

This document will focus on accessing iMAX through web service calls.

1.4 Architecture

The iMAX system is a layered architecture composed of loosely coupled modules. The architecture lends itself to reducing the impact on clients when a module needs to be changed in order to quickly accommodate changing infrastructural or technological advances. The architectural layer that most deeply impacts any Industry software vendor or any business partner with HUD is the web service module. The web service module is the gateway into HUD's infrastructure. It is built with security to adhere to HUD's security policies and with industry standards to maximize interoperability. The level of interoperability is dictated in part by dominant software platforms generally available to anyone wishing to be a business partner with HUD or provide integration services to those who do business with HUD. Interoperability is also dictated by the usefulness of the web service operations. The process of defining operations to maximize interoperability can put an enormous burden on the client and HUD in order to communicate effectively. The following subsections cover the different technologies used. This information is provided as a high level overview and is not meant as a detailed reference. When appropriate, specific implementation details are addressed as it concerns iMAX.

1.4.1 Security

Security is always a critical necessity when data exchange is concerned, especially when the data exchange occurs through open channels. Three areas of security concern were addressed when designing iMAX. These areas are: data security, authenticity of the caller, and authorization privileges.

1.4.1.1 Data Security

Data security is addressed at the transport level. All communications with iMAX is done through HTTP over SSL. All data transmissions are encrypted. Please consult your network administrator if you communicate with the internet through a proxy server.

1.4.1.2 Client Authenticity

HUD policy requires entities communicating electronically with HUD that are outside of HUD's network be authenticated. Business partners wishing to communicate with HUD electronically are required to be registered and receive HUD business partner credentials, which is a WASS ID and password. You can register with HUD's security services at HUD Secure Systems to receive the user ID and password. These credentials are required for each individual that does business with HUD. Whether communicating through a browser to access HUD resources or communicating directly with iMAX, clients will need to provide their credentials.

iMAX uses BASICAUTH authentication mechanism for all web service calls. The client will need to configure their client component to pass along WASS user ID and password with each web service call. The authentication time is miniscule compared to the processing time needed for any web service call. The mechanism for setting up BASICAUTH authentication on the client side is dependent on the software platform being used and would be outside of the web service Simple Object Access Protocol (SOAP) message. For passing the WASS MID and password, use basic authentication for web services over HTTP/S. The following is a link with examples for .NET: http://www.devx.com/codemag/Article/16762/0/page/2. Please consult any available software platform documentation concerning setting up authentication for web service calls.

1.4.1.3 Client Authorization

Once a client is authenticated, depending on the system, the client can be asked to provide system specific user credentials. iMAX will require that the client provide a TRACSMail/iMAX user ID and password. TRACSMail/iMAX ID and password are available to a business entity rather than an individual. You can request a TRACSMail/iMAX ID by contacting the Multifamily Helpdesk at 1-900-767-7588 or email TRACS@hud.gov. Since all communications are encrypted at the transport level, the user ID and password are safe. Unlike client authentication where the WASS user ID and password are passed along as part of the request header, the client authorization information is passed along as part of the operation parameter in the SOAP message.

1.4.2 Technologies

Web services can be implemented in any way that provides some service through the internet. Web service does not predefine what transport protocol to use nor the formatting of the messages going back and forth. However, to accommodate the variance of software platforms available, web services defined by the usage of the following technologies are provided to those wishing to communicate electronically with HUD. More detailed discussions about each technology are covered in the following subsections.

- Hypertext Transport Protocol / Secure Socket Layer
- eXtensible Markup Language / XML Schema Document
- Simple Object Access Protocol
- Web Services Description Language

1.4.3 HTTP / SSL

Hypertext Transport Protocol (HTTP) is a transport protocol. It sits on top of TCP/IP. Most internet technology platforms understand how to encode and send and receive and decode messages that are sent over HTTP.

Most communications on HTTP is not encrypted and is sent as plain text. It is possible to snoop HTTP communications and see the contents without any decoding of the raw data. Most informational communication through the internet does not require any security. For communications where sensitive data is transmitted, it is necessary to encrypt the data to ensure confidentiality. Secure Socket Layer (SSL) addresses this need. Both the service consumer and provider need to be able to communicate over SSL. Most software platforms support the ability to communicate using a secure connection using SSL. The Service providers will need to configure their services to use SSL as well.

As mentioned in Section 1.3.1.1, Data Security, all communications with iMAX are conducted using HTTP over SSL for the purpose of data security and integrity.

1.4.4 XML / XSD

Extensible Markup Language (XML) provides a means to format data or a document so that the data and/or document can be visually readable as well as readable by most software platforms. The XML schema document uses XML to specify a specific language set that a service provider understands. Clients wishing to communicate with a service provider must use the specified XML Schema Definition (XSD) to format their messages so that the service provider understands what to do.

Though the Monthly Activity Transmission (MAT) files submitted to iMAX are not currently formatted using XML, the surrounding technologies that create and read the transmission messages use XML. Therefore, it is necessary that anyone who wishes to communicate with iMAX have a foundational understanding of XML and XSD.

1.4.5 SOAP

Simple Object Access Protocol (SOAP) uses an XML defined language set to define a message format that can be understood by both clients and web service providers. SOAP defines the message, message header, and message content for all communications. It is good to have an understanding of what role SOAP plays in consuming and providing web services

The details at the SOAP level are usually hidden from the client software development platform as it can be a confusing task trying to manually create, send, and receive SOAP messages. It is highly discouraged to manually manipulate SOAP messages.

1.4.6 WSDL

Consumers of web services need a Web Service Description Language document (WSDL) from the service provider. Without one, it is impossible to know how to organize the SOAP message and the address to send the SOAP message.

The WSDL document can be distributed through a web browser, HTTP request, or as a file. The WSDL document contains all that is necessary for a web service consumer to

create components that consume web services. It provides messages, operations, parameters, data types, transport protocol, messaging protocol, and address of the web service.

Note: The iMAX WSDL will be provided along with this document on the TRACS documents webpage: http://www.hud.gov/offices/hsg/mfh/trx/trxdocs.cfm.

1.5 Conventions

This section addresses some conventions used specifically for iMAX.

1.5.1 Session

iMAX permits multiple and concurrent web service requests using the same WASS user ID and TRACSMail/iMAX user ID. iMAX will not set timeouts for a call; any time outs will need to be set on the vendor software side. The duration and timeout of a request is configured on the client side. For transmission of large amounts of data, the timeout of a request should be set accordingly. iMAX does not retain a conversational state between web service calls. Each call is a discrete and independent call of any subsequent calls. This requires that each call provide both the WASS user ID and TRACSMail/iMAX user ID. The authentication and authorization of each call is miniscule compared to the overall transaction time. More information regarding sample timeouts can be provided after testing/UAT is completed.

1.5.2 RPC / Encoded

Interoperability is partially determined by the binding style and encoding style at the SOAP message level defined in the WSDL. Using the Document/Literal combination increases interoperability, however it reduces the ability to provide for a more flexible web service interface. To enable defining an unrestricted number of files that can be transmitted the RPC/Encoded combination was used. This combination is acceptable for the more dominant language platforms like .NET and Java.

2.0 SERVICES

The services provided by iMAX are those necessary by any web service capable software system to support an Industry user's need to conduct business with HUD. The web browser interface for iMAX provides a richer set of functionality for an Industry user. The following section describes the five main functional capabilities provided by iMAX:

- Submission of one or many MAT file(s) to TRACS
- Submission of one or many file(s) to one or more other iMAX users
- Download of one or many file(s) sent by other iMAX users
- Download of TRACS processing result file(s)
- Download of broadcast messages from iMAX system administrators

2.1 Submission of Files to TRACS

iMAX provides the following operations to enable submission of MAT files to TRACS (uploadFiles) and to track prior submissions (retrieve outgoing files to TRACS: getTracsRequestHeaders and getTracsRequests). WASS user ID and password will be passed along with the web service call outside of the web service SOAP message (see section 1.4.1.2).

For Outgoing files to TRACS, there are two operations that can be used. One operation, getTracsRequestHeaders, retrieves just header information (no files) and the other operation, getTracsRequests, retrieves all information (files included). Both operations include a filter with the following options:

- start date and end date inclusive
- array of Transaction IDs

For each call, only one filter can be specified. If more than one filter is specified, the order of priority will be the Transaction ID filter, then the date/time range filter. If the filters are left blank, the default will be to retrieve all messages.

2.1.1 uploadFiles

The uploadFiles operation can be used to send files to TRACS and/or to other iMAX users. A single call to uploadFiles can specify TRACMPROD or TRACMTEST but not both. To send files to both TRACMPROD and TRACMTEST requires making two calls.

Operation Inputs:

Parameter	Description	Requirement	Data Type
imax_id	This is the same as the ID used for TRACSMail.	REQUIRED	String

	Format should be 10 characters, with first five characters are 'TRACM' followed by five numeric characters. Use TRACMPROD to send files to TRACS Production and TRACMTEST to send files to TRACS Test. Example: TRACM12345.		
pass_wd	This is the same as the password used for TRACSMail.	REQUIRED	String
upload_request	This is the content of the request.	REQUIRED	UploadRequest See section 4.1.14 for additional information about the UploadRequest data type.

Operation Outputs:

Parameter	**Description**	**Data Type**
statusCode	A numeric code indicating success or failure. 200 – Success 300 – Missing Files 400 – Authentication of iMAX User ID and Password Failed 401- Authentication of WASS User ID and Password Failed **October 2010 Release** 402 – WASS User Needs to Accept the Rules of Behavior **October 2010 Release** 403 – (Forbidden). The WASS ID is not in the imaxuser LDAP group 405 – LDAP Communication Error – System unavailable 500 – Internal System Error	Integer
statusMessage	A textual description of the status	String

	code.	
transactionID	The transaction ID associated with the upload request. Example: TIN1228200700000001	String

2.1.2 getTracsRequestHeaders

The getTracsRequestHeaders operation is used to retrieve header information about the upload requests that have been sent by the specified iMAX user specified by imax_id parameter. This operation returns all header information about upload requests without the files that were sent. A filter can be applied to limit the number of request headers to retrieve.

Operation Inputs:

Parameter	Description	Requirement	Data Type
imax_id	This is the same as the ID used for TRACSMail. Format should be 10 characters, with first five characters are 'TRACM' followed by five numeric characters. Example: TRACM12345.	REQUIRED	String
pass_wd	This is the same as the password used for TRACSMail.	REQUIRED	String
filter	This is used to limit the number of request headers returned.	OPTIONAL	OutboundFilter See Section 4.1.7 for detailed information about the OutboundFilter data type.

Operation Outputs:

Parameter	Description	Data Type
statusCode	A numeric code indicating success or failure. 200 – Success 400 – Authentication of iMAX User ID and Password Failed 401 – Authentication of WASS	Integer

	User ID and Password Failed **October 2010 Release** 402 – WASS User Needs to Accept the Rules of Behavior **October 2010 Release** 403 – (Forbidden). The WASS ID is not in the imaxuser LDAP group 405 – LDAP Communication Error – System unavailable 500 – Internal System Error 603 – No Requests Found	
statusMessage	A textual description of the status code.	String
requests	An array of TracsRequestHeader's which contain meta data about submissions previously made.	TracsRequestHeader array See Section 4.1.11 for additional information about TracsRequestHeader data type.

2.1.3 getTracsRequests

The getTracsRequests operation is used to retrieve information about upload requests to TRACS including the files that were submitted. This operation returns an array of requests. A filter can be applied to limit the number of requests to retrieve.

Operation Inputs:

Parameter	Description	Requirements	Data Type
imax_id	This is the same as the ID used for TRACSMail. Format should be 10 characters, with first five characters are 'TRACM' followed by five numeric characters. Example: TRACM12345.	REQUIRED	String
pass_wd	This is the same as the password used for TRACSMail.	REQUIRED	String
filter	This is used to limit the number of request headers returned.	OPTIONAL	OutboundFilter See Section 4.1.7 for additional

			information about OutboundFilter data type.

Operation Outputs:

Parameter	Description	Data Type
statusCode	A numeric code indicating success or failure. 200 – Success 400 – Authentication of iMAX User ID and Password Failed 401 – Authentication of WASS User ID and Password Failed **October 2010 Release** 402 – WASS User Needs to Accept the Rules of Behavior **October 2010 Release** 403 – (Forbidden). The WASS ID is not in the imaxuser LDAP group 405 – LDAP Communication Error – System unavailable 500 – Internal System Error 603 – No Requests Found	Integer
statusMessage	A textual description of the status code.	String
requests	An array of TracsRequest's	TracsRequest array Please see Section 4.1.10 for details about the TracsRequest data type

2.2 Submission of Files to Other iMAX Users

iMAX provides the following operations to enable submission of files to other iMAX users (uploadFiles) and to track prior files sent (retrieve outgoing files to other users: getOutboxMessageHeaders and getOutboxMessages). WASS user ID and password will be passed along with the web service call outside of the web service SOAP message (see section 1.4.1.2).

For Outgoing files to other iMAX users, there are two operations that can be used. One operation, getOutboxMessageHeaders, retrieves just header information (no files) and the other operation, getOutboxMessages, retrieves all information (files included). Both operations include a filter with the following options:

- start date and end date inclusive
- array of Transaction IDs

For each call, only one filter can be specified. If more than one filter is specified, the order of priority will be the Transaction ID filter, then the date/time range filter. If the filters are left blank, the default will be to retrieve all messages.

2.2.1 uploadFiles

The uploadFiles operation to send files to other iMAX users is the same operation as the one used to submit files to be sent to TRACS specified in Section 2.1.1. Recipients must be specified to send files to other iMAX users. The following two operations are used to retrieve files sent by other iMAX users to a specified iMAX user.

Operation Inputs:

Parameter	Description	Requirement	Data Type
imax_id	This is the same as the ID used for TRACSMail. Format should be 10 characters, with first five characters are 'TRACM' followed by five numeric characters. Example: TRACM12345.	REQUIRED	String
pass_wd	This is the same as the password used for TRACSMail.	REQUIRED	String
upload_request	This is the content of the request.	REQUIRED	UploadRequest See section 4.1.14 for additional information about the UploadRequest data type.

Operation Outputs:

Parameter	Description	Data Type
statusCode	A numeric code indicating success or failure. 200 – Success 300 – Missing Files 400 – Authentication of iMAX User ID and Password Failed 401 – Authentication of WASS User	Integer

	ID and Password Failed **October 2010 Release** 402 – WASS User Needs to Accept the Rules of Behavior **October 2010 Release** 403 – (Forbidden). The WASS ID is not in the imaxuser LDAP group 405 – LDAP Communication Error – System unavailable 500 – Internal System Error	
statusMessage	A textual description of the status code.	String
transactionID	The transaction ID associated with the upload request. Example: TIN1228200700000001	String

2.2.2 getOutboxMessageHeaders

The getOutboxMessageHeaders operation is used to retrieve header information about the messages that were sent out by the iMAX user specified by the imax_id parameter. The results contain only the header information and do not contain the actual files.

Operation Inputs:

Parameter	Description	Requirement	Data Type
imax_id	This is the same as the ID used for TRACSMail. Format should be 10 characters, with first five characters are 'TRACM' followed by five numeric characters. Example: TRACM12345.	REQUIRED	String
pass_wd	This is the same as the password used for TRACSMail.	REQUIRED	String
filter	This is used to limit the number of outbox messages returned.	OPTIONAL	OutboundFilter See Section 4.1.7 for detailed information about the OutboundFilter data type.

Operation Outputs:

Parameter	Description	Data Type
statusCode	A numeric code indicating success or failure. 200 – Success 400 – Authentication of iMAX User ID and Password Failed 401 – Authentication of WASS User ID and Password Failed **October 2010 Release** 402 – WASS User Needs to Accept the Rules of Behavior **October 2010 Release** 403 – (Forbidden). The WASS ID is not in the imaxuser LDAP group 405 – LDAP Communication Error – System unavailable 500 – Internal System Error 600 – No Messages Found in outbox	Integer
statusMessage	A textual description of the status code.	String
headers	An array of OutboxMessageHeader's	OutboxMessageHeader array See Section 4.1.9 for additional information about OutboxMessageHeader data type

2.2.3 getOutboxMessages

The getOutboxMessages operation is used to retrieve all messages sent to another iMAX user. This operation is used to retrieve any associated files that were sent to other iMAX users. An optional filter can be used to limit the number of results.

Operation Inputs:

Parameter	Description	Requirement	Data Type
imax_id	This is the same as the ID used for TRACSMail. Format should be 10 characters, with first five characters are 'TRACM' followed by five numeric	REQUIRED	String

	characters. Example: TRACM12345.		
pass_wd	This is the same as the password used for TRACSMail.	REQUIRED	String
filter	This is used to limit the number of outbox messages returned.	OPTIONAL	OutboundFilter See Section 4.1.7 for detailed information about the OutboundFilter data type.

Operation Outputs:

Parameter	**Description**	**Data Type**
statusCode	A numeric code indicating success or failure. 200 – Success 400 – Authentication of iMAX User ID and Password Failed 401 – Authentication of WASS User ID and Password Failed **October 2010 Release** 402 – WASS User Needs to Accept the Rules of Behavior **October 2010 Release** 403 – (Forbidden). The WASS ID is not in the imaxuser LDAP group 405 – LDAP Communication Error – System unavailable 500 – Internal System Error 600 – No Messages Found in outbox	Integer
statusMessage	A textual description of the status code.	String
messages	An array of OutboxMessageHeader's	OutboxMessageHeader array See Section 4.1.9 for additional information about OutboxMessageHeader data type

2.3 Download of TRACS Processing Results

iMAX provides the following operations to enable downloading of TRACS processing result files. To retrieve incoming files from TRACS, there are two operations. One operation, getTracsResultHeaders, retrieves just header information (no files) and the other operation, getTracsResults, retrieves all information (files included). The reasoning for providing both operations is to provide "lazy-loading" capabilities to the software vendor. "Lazy-loading" provides the software vendor the ability to perform normal processing without having to wait to download all files as well as the ability to retrieve data at the point it is needed.

Both operations include a filter with the following options:

- start date and end date inclusive
- array of Transaction IDs
- downloaded or new indicator (0 = all, 1 = new)

For each call, only one filter can be specified. If more than one filter is specified, the order of priority will be the Transaction ID filter, then the Downloaded/New filter, and finally the date/time range filter. If the filters are left blank, the default will be to retrieve all messages.

2.3.1 getTracsResultHeaders

The getTracsResultHeaders operation is used to retrieve header information about the TRACS processing result files that have been sent to the iMAX user specified by imax_id parameter. This operation returns all header information about processing results without the files.

Operation Inputs:

Parameter	Description	Requirement	Data Type
imax_id	This is the same as the ID used for TRACSMail. Format should be 10 characters, with first five characters are 'TRACM' followed by five numeric characters. Values would be either TRACMPROD or TRACMTEST.	REQUIRED	String
pass_wd	This is the same as the password used for TRACSMail.	REQUIRED	String
filter	Used to limit the retrieval	OPTIONAL	InboundFilter

	result set. Please see Section 2 concerning the usage of the filter.		Please see Section 4.1.4 for additional information about InboundFilter data type.

Operation Outputs:

Parameter	Description	Data Type
statusCode	A numeric code indicating success or failure. 200 – Success 400 – Authentication of iMAX User ID and Password Failed 401 – Authentication of WASS User ID and Password Failed **October 2010 Release** 402 – WASS User Needs to Accept the Rules of Behavior **October 2010 Release** 403 – (Forbidden). The WASS ID is not in the imaxuser LDAP group 405 – LDAP Communication Error – System unavailable 500 – Internal System Error 602 – No Results Found	Integer
statusMessage	A textual description of the status code.	String
results	An array of TracsResultHeader's	TracsResultHeader array Please see Section 4.1.3 for additional information about the TracsResultHeader data type.

2.3.2 getTracsResults

The getTracsResults operation is used to retrieve an array of processing results from TRACS. This operation returns all header information and files associated with a response from TRACS. A filter is provided to limit the retrieval results.

Operation Inputs:

Parameter	Description	Requirement	Data Type
imax_id	This is the same as the ID used for TRACSMail. Format should be 10 characters, with first five characters are 'TRACM' followed by five numeric characters. Values would be either TRACMPROD or TRACMTEST.	REQUIRED	String
pass_wd	This is the same as the password used for TRACSMail.	REQUIRED	String
filter	Used to limit the retrieval result set. Please see Section 2 concerning the usage of the filter.	REQUIRED	InboundFilter Please see Section 4.1.4 for additional information about InboundFilter data type.

Operation Outputs:

Parameter	Description	Data Type
statusCode	A numeric code indicating success or failure. 200 – Success 400 – Authentication of iMAX User ID and Password Failed 401 – Authentication of WASS User ID and Password Failed **October 2010 Release** 402 – WASS User Needs to Accept the Rules of Behavior **October 2010 Release** 403 – (Forbidden). The WASS ID is not in the imaxuser LDAP group 405 – LDAP Communication Error – System unavailable 500 – Internal System Error 602 – No Results Found	Integer

statusMessage	A textual description of the status code.	String
results	An array of TracsResult's	TracsResult array Please see Section 4.1.12 for additional information about TracsResult data type

2.4 Download of Files from Other iMAX Users

iMAX provides the following operations to enable downloading of files from other iMAX users. To retrieve incoming files from other users, there are two operations. One operation, getInboxMessageHeaders, retrieves just header information (no files) and the other operation, getInboxMessages, retrieves all information (files included). The reasoning for providing both operations is to provide "lazy-loading" capabilities to the software vendor. "Lazy-loading" provides the software vendor the ability to perform normal processing without having to wait to download all files as well as the ability to retrieve data at the point it is needed.

Both operations include a filter with the following options:

- start date and end date inclusive
- array of Transaction IDs
- downloaded or new indicator (0 = all, 1 = new)

For each call, only one filter can be specified. If more than one filter is specified, the order of priority will be the Transaction ID filter, then the Downloaded/New filter, and finally the date/time range filter. If the filters are left blank, the default will be to retrieve all messages.

2.4.1 getInboxMessageHeaders

The getInboxMessageHeaders operation is used to retrieve header information about file messages sent to the iMAX user specified by imax_id parameter from another iMAX user. This operation returns each message's header information without the files.

Operation Inputs:

Parameter	**Description**	**Requirement**	**Comment**
imax_id	This is the same as the ID used for TRACSMail. Format should be 10 characters, with first five characters are 'TRACM' followed by five numeric characters. Example:	REQUIRED	String

	TRACM12345.		
pass_wd	This is the same as the password used for TRACSMail.	REQUIRED	String
filter	This is used to limit the number of inbox messages returned.	OPTIONAL	InboundFilter See Section 4.1.4 for detailed information about the InboundFilter data type.

Operation Outputs:

Parameter	**Description**	**Comment**
statusCode	A numeric code indicating success or failure. 200 – Success 400 – Authentication of iMAX User ID and Password Failed 401 – Authentication of WASS User ID and Password Failed **October 2010 Release** 402 – WASS User Needs to Accept the Rules of Behavior **October 2010 Release** 403 – (Forbidden). The WASS ID is not in the imaxuser LDAP group 405 – LDAP Communication Error – System unavailable 500 – Internal System Error 601 – No Messages Found in inbox	Integer
statusMessage	A textual description of the status code.	String
headers	An array of InboxMessageHeader's	InboxMessageHeader array See Section 4.1.6 for additional information about InboxMessageHeader data type

2.4.2 getInboxMessages

The getInboxMessages operation is used to retrieve file messages sent by another iMAX user to the user specified by the imax_id parameter. This operation returns all information and files associated with a file message. An optional filter can be specified to limit the result set.

Operation Inputs:

Parameter	Description	Requirement	Comment
imax_id	This is the same as the ID used for TRACSMail. Format should be 10 characters, with first five characters are 'TRACM' followed by five numeric characters. Example: TRACM12345.	REQUIRED	String
pass_wd	This is the same as the password used for TRACSMail.	REQUIRED	String
filter	This is used to limit the number of inbox messages returned.	OPTIONAL	InboundFilter See Section 4.1.4 for detailed information about the InboundFilter data type.

Operation Outputs:

Parameter	Description	Comment
statusCode	A numeric code indicating success or failure. 200 – Success 400 – Authentication of iMAX User ID and Password Failed 401 – Authentication of WASS User ID and Password Failed **October 2010 Release** 402 – WASS User Needs to Accept the Rules of Behavior **October 2010 Release** 403 – (Forbidden). The WASS ID is not in the imaxuser LDAP	Integer

	group 405 – LDAP Communication Error – System unavailable 500 – Internal System Error 601 – No Messages Found in inbox	
statusMessage	A textual description of the status code.	String
messages	An array of InboxMessage's	InboxMessage array See Section 4.1.5 for additional information about InboxMessage data type

2.5 Download of Broadcast Messages

The following operation is made available to retrieve broadcast messages sent by the iMAX system administrator. For broadcast messages, a filter will be provided that accepts a single date parameter called broadcastDate. The date parameter designates the date on and after broadcast messages will be retrieved.

2.5.1 getBroadcastMessages

The getBroadcastMessages operation is used to retrieve broadcast messages sent by the iMAX system administrator to the iMAX user community.

Operation Inputs:

Parameter	Description	Requirement	Data Type
imax_id	This is the same as the ID used for TRACSMail.	REQUIRED	String
pass_wd	This is the same as the password used for TRACSMail.	REQUIRED	String
filter	A filter that can be used to limit the number broadcast messages to retrieve.	OPTIONAL	BroadcastMessageFilter See Section 4.1.2 for details of BroadcastMessageFilter type.

Operation Outputs:

Parameter	Description	Data Type

messages	An array of broadcast messages. If the statusCode is anything other than 200, then the array is empty.	BroadcastMessage array See Section 4.1.1 for details of BroadcastMessage type.
statusCode	A numeric code indicating success or failure. 200 – Success 400 – Authentication of iMAX User ID and Password Failed 401 – Authentication of WASS User ID and Password Failed **October 2010 Release** 402 – WASS User Needs to Accept the Rules of Behavior **October 2010 Release** 403 – (Forbidden). The WASS ID is not in the imaxuser LDAP group 405 – LDAP Communication Error – System unavailable 500 – System Error 604 – No Broadcast Messages	Integer
statusMessage	A textual description of the status code	String

2.6 All Operations

The following operations are provided as a convenience mechanism to consolidate three separate calls to getBroadcastMessages, getInboxMessages, and getTracsRequests into a single call. There are two operations. The first operation provides just header information and full broadcast messages. The second operation provides all information, including files, and full broadcast messages.

Both operations have filters as well. The Transaction ID array, start/end date, and downloaded new indicator parameters will apply equally to both the files from other iMAX users and the files from TRACS. To filter the broadcast messages, the broadcastDate filter should be used.

2.6.1 getAll

The getAll operation is used to retrieve broadcast messages, inbox messages, and TRACS results in a single call.

Operation Inputs:

Parameter	Description	Requirement	Data Type
imax_id	This is the same as the ID used for TRACSMail.	REQUIRED	String
pass_wd	This is the same as the password used for TRACSMail.	REQUIRED	String
filter	A filter that can be used to limit the number of TracsResult and InboxMessage to retrieve.	OPTIONAL	InboundFilter See Section 4.1.4 for details of InboundFilter type.
broadcast_filter	A filter that can be used to limit the number of BroadcastMessage's to retrieve.	OPTIONAL	BroadcastMessageFilter See Section 4.1.2 for additional information about BroadcastMessageFilter data type.

Operation Outputs:

Parameter	Description	Data Type
broadcastMessages	An array of broadcast messages.	BroadcastMessage array See Section 4.1.1 for details of BroadcastMessage type.
inboxMessages	an Array of InboxMessage' s that contain files from other iMAX users.	InboxMessage array See Section 4.1.5 for additional information about InboxMessage data type.
tracsResults	An array of TracsResult's that contain the result data from TRACS	TracsResult array See Section 4.1.12 for additional information about TracsResult data type.
statusCode	A numeric code indicating success or failure. 200 – Success 400 – Authentication of iMAX User ID and Password Failed 401 – Authentication of WASS	Integer

	User ID and Password Failed **October 2010 Release** 402 – WASS User Needs to Accept the Rules of Behavior **October 2010 Release** 403 – (Forbidden). The WASS ID is not in the imaxuser LDAP group 405 – LDAP Communication Error – System unavailable 500 – System Error	
statusMessage	A textual description of the status code	String

2.6.2 getAllHeaders

The getAllHeaders operation is used to retrieve broadcast messages, inbox messages, and TRACS results in a single call. This operation unlike the getAll operation returns only header information about inbox messages and TRACS results. It does return the full broadcast messages.

Operation Inputs:

Parameter	Description	Requirement	Data Type
imax_id	This is the same as the ID used for TRACSMail.	REQUIRED	String
pass_wd	This is the same as the password used for TRACSMail.	REQUIRED	String
filter	A filter that can be used to limit the number of TracsResult and InboxMessage to retrieve.	OPTIONAL	InboundFilter See Section 4.1.4 for details of InboundFilter type.
broadcast_filter	A filter that can be used to limit the number of BroadcastMessage's to retrieve.	OPTIONAL	BroadcastMessageFilter See Section 4.1.2 for additional information about BroadcastMessageFilter data type.

Operation Outputs:

Parameter	Description	Data Type
broadcastMessages	An array of broadcast messages.	BroadcastMessage array See Section 4.1.1 for details of BroadcastMessage type.
inboxMessageHeaders	An Array of InboxMessageHeader's.	InboxMessageHeaders array See Section 4.1.6 for additional information about InboxMessage data type.
tracsResultHeaders	An array of TracsResultHeader's.	TracsResult array See Section 4.1.13 for additional information about TracsResult data type.
statusCode	A numeric code indicating success or failure. 200 – Success 400 – Authentication of iMAX User ID and Password Failed 401 – Authentication of WASS User ID and Password Failed **October 2010 Release** 402 – WASS User Needs to Accept the Rules of Behavior **October 2010 Release** 403 – (Forbidden). The WASS ID is not in the imaxuser LDAP group 405 – LDAP Communication Error – System unavailable 500 – System Error	Integer
statusMessage	A text message of the result of the call.	String

3.0 MILESTONES

The development for iMAX is an iterative process that will consist of cycles with developing certain features of iMAX. Once all features have been developed, a User Acceptance Testing (UAT) period will occur with the Working Group.

April 2010 Release (No Impact to Industry Software)
In April, 2010, the user interface changes, including the implementation of the Rules of Behavior service, of iMAX will go into effect. Starting April 30th, users will have to accept the Rules of Behavior before being able to access the iMAX web system (user interface.)
April 2010 Release (No Impact to Industry Software)

October 2010 Release
On October 1, 2010, the iMAT service will replace all iMAX and mainframe interactions with regards to the MAT edits. This will only impact how the Industry submits files regarding the fact that the ROB must be have been accepted for the WASS ID used to submit the files. Additionally, the format of the MAT response messages (TENER, VCHER, TENTR, and VCHTR) will be slightly different (please see section 4.4 of this document for an example of the new format).
October 2010 Release

The following dates provide the industry impact milestones for iMAX:

ROB Available via User Module User Interface for Acceptance

Event	Start Date	Finish Date
Working Group UAT	3/10/202010	3/23/2010
Production	4/30/2010	

MAT Processing and Error Changes

Event	Start Date	Finish Date
Working Group UAT	8/9/2010	8/23/2010
Production	10/1/2010	

4.0 APPENDIX

4.1 Complex Data Types

This section describes the complex data types that make up the building blocks for parameters to and from iMAX. They are described in more detail in the types section of the WSDL document.

4.1.1 BroadcastMessage

BroadcastMessage contains the messages created by a HUD administrator as a general notification to all iMAX users.

Element	Description	Data Type
messageID	A unique identifier for a broadcast message	Integer
Message	A textual message from the iMAX system administrator	String
messageDate	The date on which the message was broadcasted. This date is used to compare against when BroadcastMessageFilter is applied.	Date

4.1.2 BroadcastMessageFilter

BroadcastMessageFilter is used to filter the number of broadcast messages to retrieve.

Element	Description	Data Type
startDate	The date on and after which to retrieve broadcast messages. This value is compared against the messageDate from BroadcastMessage.	Date

4.1.3 IMAXFile

IMAXFile is the complex type used to capture a single file submitted to TRACS and/or to other iMAX users.

Element	Description	Data Type
fileName	The name of the file to be sent. Example: VOUCHER.TXT	String

fileContents	This is the byte array of the contents of the file. The method used in retrieving the byte array is specific to the client software platform.	base64Binary

4.1.4 InboundFilter

InboundFilter is the complex type used to specify parameters to limit the returning result for the following operations:

- getTracsResults
- getTracsResultHeaders
- getInboxMessages
- getInboxMessageHeaders

Please see Section 2 concerning priority and usage of the filter.

Element	Description	Data Type
startDate	The lower boundary of the date range on which to search on used in conjunction with endDate to specify a range from which to retrieve results. When used with the getTracsResults and getTracsResultHeaders operation the receivedDate is compared against this value. When used with the getInboxMessages and getInboxMessageHeaders operation the receivedDate is compared against this value.	Date
endDate	The upper boundary of the date range on which to search on used in conjunction with startDate to specify a range from which to retrieve results. When used with the getTracsResults and getTracsResultHeaders operation the receivedDate is compared against this value. When used with the getInboxMessages and getInboxMessageHeaders operation the receivedDate is compared against this value.	Date

statusInd	Indicator that specifies whether to retrieve all or only new results from TRACS and/or inbox message from other iMAX users. 0 – ALL 1 - NEW	Integer
Ids	This is used to specify specific results or inbox messages to retrieve based on the transactionIDs. This array should contain InboxMessage transaction ID's or TracsResult transaction IDs.	String array

4.1.5 InboxMessage

This complex type contains the details of a single inbox message to an iMAX user sent by another iMAX user.

Element	Description	Data Type
files	The files that were sent by another iMAX user. Defined as an array of IMAXFile types.	IMAXFile array
receivedDate	The date on which the file message was received by iMAX.	Date
sender	The TRACSMail ID of the iMAX user who sent the file message	String
subject	A text of a subject line specified by the iMAX user	String
transactionID	The transactionID generated by iMAX as a unique identifier for this message	String
fileNames	An array of strings that specify the sent file names.	String array

4.1.6 InboxMessageHeader

This complex type contains the details of a file message sent by another iMAX user. This complex type unlike the InboxMessage complex type does not contain the file bytes.

Element	Description	Data Type
receivedDate	The date on which the file message was received by iMAX.	Date
sender	The TRACSMail ID of the iMAX user who sent the file message	String
subject	A text of a subject line specified by the iMAX user	String
transactionID	The transactionID generated by iMAX as	String

	a unique identifier for this message	
fileNames	An array of strings that specify the sent file names.	String array

4.1.7 OutboundFilter

OutboundFilter is the complex type used to specify parameters to limit the returning result for the following operations:

- getTracsRequests
- getTracsRequestHeaders
- getOutboxMessages
- getOutboxMessageHeaders

Please see Section 2 concerning priority and usage of the filter.

Element	Description	Data Type
startDate	The lower boundary of the date range on which to search on, used in conjunction with endDate to specify a range from which to retrieve results. When used with the getTracsRequests and getTracsRequestHeaders operation the uploadedDate is compared against this value. When used with the getOutboxMessages and getOutboxMessageHeaders operation the sentDate is compared against this value.	Date
endDate	The upper boundary of the date range on which to search on, used in conjunction with startDate to specify a range from which to retrieve results. When used with the getTracsRequests and getTracsRequestHeaders operation the uploadedDate is compared against this value. When used with the getOutboxMessages and getOutboxMessageHeaders operation the sentDate is compared against this value.	Date

Ids	This is used to specify specific requests or outbox messages to retrieve based on the transactionIDs. This array should contain OutboxMessage transaction ID's or TracsRequest transaction IDs.	String array

4.1.8 OutboxMessage

OuboxMessage complex type details the message that was sent to other iMAX users using the uploadFiles operation. It contains the meta data as well as the actual file contents.

Element	Description	Data Type
files	This array contains the files that were sent to other iMAX users defined by the IMAXFile data type.	IMAXFile array
fileNames	An array of file names matching the files element.	String array
recipients	A String array of recipients to which the message was sent to	String array
sentDate	The date on which iMAX received the uploadFiles call with an iMAX user specified in the recipient list.	Date
subject	A text of a subject line specified	String
transactionID	The transactionID generated by iMAX as a unique identifier for this message	String

4.1.9 OutboxMessageHeader

OuboxMessage complex type details the message that was sent to other iMAX users using the uploadFiles operation. It contains only the meta data and not the actual file contents.

Element	Description	Data Type
fileNames	An array of strings containing the names of the files sent to other iMAX users.	String array
recipients	A String array of recipients to which the message was sent to	String array
sentDate	The date on which iMAX received the uploadFiles call with an iMAX user specified in the recipient list.	Date
subject	A text of a subject line specified	String
transactionID	The transactionID generated by iMAX as a unique identifier for this message	String

4.1.10 TracsRequest

TracsRequest complex type contains all about previous upload submissions made to TRACS.

Element	Description	Data Type
recipients	An array of strings containing all recipients of the uploadFiles operation. It can contain other iMAX users. It does contain at least TRACMPROD or TRACMTEST.	String array
status	An indicator of the status of the upload to TRACS. R – Received but not transmitted to TRACS T – Transmitted to TRACS for processing	String
subject	The text of the subject that was specified by the uploadFiles operation.	String
transactionID	The iMAX generated unique identifier for the upload request that was received.	String
transmittedDate	The date on which the uploaded files were sent to TRACS	Date
uploadedDate	The date on which iMAX received the uploadFiles operation	Date
files	An array of files that were sent to TRACS defined by the IMAXFile complex type.	IMAXFile array

4.1.11 TracsRequestHeader

TracsRequestHeader complex type contains meta data about previous upload submissions made to TRACS.

Element	Description	Data Type
recipients	An array of strings containing all recipients of the uploadFiles operation. It can contain other iMAX users. It does contain at least TRACMPROD or TRACMTEST.	String array
status	The status of the submitted request to TRACS. Only applicable if upload request specified TRACMPROD or TRACMTEST as one of the recipients.	String
subject	The subject header that was sent as part of the upload request.	String

transactionID	The transaction ID that uniquely identifies each upload request. Example: TIN12282007000001	String
transmittedDate	The date on which the submitted files were sent to TRACMPROD or TRACMTEST for processing.	Date
uploadedDate	The date on which the submitted files were received by iMAX.	Date

4.1.12 TracsResult

TracsResult complex type contains the details of the TRACS process results, including the file generated by TRACS.

Element	Description	Data Type
sender	The name of the system from which the result was sent, either TRACMPROD or TRACMTEST	String
status	An indicator of whether the result was downloaded or not N – New and not downloaded by iMAX user D – Already downloaded at least once	String
subject	The text of the subject that was specified TRACS.	String
transactionID	The iMAX generated unique identifier for the result that was received from TRACS.	String
receivedDate	The date on which the result was received by iMAX from TRACS.	Date
files	An array of files that were received from TRACS defined by the IMAXFile complex type.	IMAXFile array

4.1.13 TracsResultHeader

TracsResult complex type contains the details of the TRACS process results, excluding the file generated by TRACS.

Element	Description	Data Type
sender	The name of the system from which the result was sent, either TRACMPROD or TRACMTEST	String

status	An indicator of whether the result was downloaded or not N – New and not downloaded by iMAX user D – Already downloaded at least once	String
subject	The text of the subject that was specified TRACS.	String
transactionID	The iMAX generated unique identifier for the result that was received from TRACS.	String
receivedDate	The date on which the result was received by iMAX from TRACS.	Date

4.1.14 UploadRequest

UploadRequest complex type contains the details for uploading files to TRACS and/or to other IMAX users.

Element	Description	Data Type
files	An array of IMAXFile. This array contains the files to be submitted.	IMAXFile array
recipients	This is an array of iMAX user ids to send the attached files to including TRACS production and TRACS test . The iMAX user ID format is 10 characters, with first five characters are 'TRACM' followed by five numeric characters. Use TRACMPROD for TRACS Production and TRACMTEST for TRACS test environment. NOTE: Either TRACMPROD or TRACMTEST can be specified but NOT both in the recipients. Example: TRACM12345.	String array
subject	This is a text element in which any message can be specified for any purpose. Limited to 100 characters.	String

4.2 WSDL

The iMAX WSDL will be provided along with this document on the TRACS documents webpage: http://www.hud.gov/offices/hsg/mfh/trx/trxdocs.cfm.

4.3 Basic Usage

This section provides basic usage of a client component that consumes the iMAX web services.

NOTE : Due to the variance of client platforms that support consuming web services, the usage of operations described in this section is pseudo code and not meant to be explicit and workable code for any software platform. The pseudo code also assumes that the details of marshalling and unmarshalling of SOAP messages and the complex schema types are already done.

4.3.1 Uploading Files

The following describes the calls to upload files.

```
Create Web Service consuming stub
Set BASICAUTH credentials
Create UploadRequest

Create Array of IMAXFile
Read file contents of File1 into byte array
Set IMAXFile.filename to File1 name
Set IMAXFile.filecontents to File1 byte array
Add IMAXFile to array of IMAXFile
Set UploadRequest.files = array of IMAXFile
Set UploadRequest.recipients = array of TRACM ID's
Set UPloadRequest.subject = Subject string

Response = Web Service.uploadFiles (UploadRequest)

Check Response.statusCode to see if 200
Get Response.transactionID for storage
```

4.3.2 Retrieving Outbox Messages

The following describes the call retrieve outbox messages.

```
Create Web Service consuming stub
Set BASICAUTH credentials
Create aFilter = OutboundFilter

Set aFilter.startDate = today – 7 days
Set aFilter.endDate = today
Response = Web Service.getOutboxMessages(iMAX_ID,
password, aFilter)

Check Response.statusCode to see if 200
```

```
Get Response.InboxMessages
```

4.3.3 Retrieving All

The following describes the call retrieve broadcast messages, inbox messages, and TRACS results.

```
Create Web Service consuming stub
Set BASICAUTH credentials
Create aFilter = InboundFilter
Create aBroadcastFilter = BroadcastMessageFilter

Set aFilter.statusInd = 1 (New)
Set aBroadcastFilter.startDate = today
Response = Web Service.getAll(iMAX_ID, password,
aFilter, aBroadcastFilter)

Check Response.statusCode to see if 200
Get Response.broadcastMessages
Get Response.InboxMessages
Get Response.tracsResults
```

4.4 MAT Messages

October 2010 Release

This section describes the messages that will be returned to the user after the MAT edit process has been performed by the iMAT service. Per a request from the industry, instead of a single long row of data for each record, the output will be formatted to enhance readability of the errors.

4.4.1 Tenant MAT Error Record (TENER)

The Tenant MAT Error Record (TENER) is being reformatted to allow for easier readability. The new format of the TENER is as follows:

TENER Tenant MAT Error Record						
MAT Field	**Note**	**Field Name**	**Field Label (Now Included in Output)**	**Maximum Field Length**	**Field Type**	**Edits/Source/Results**
				Note: M = Mandatory		
1	**M**	Processing Mailbox ID, Sender's Telecom Address, and Project's Telecom Address	N/A	24	Alphanumeric	Processing Mailbox ID value: @*@ Sender's Telecom Address is the telecommunications identifier assigned by HUD to the sender submitting the data to TRACS. The first 5 characters (not including spaces) after "@*@" must contain "TRACM". The next 5 positions are the HUD assigned number. **(Formerly Mailbox ID)** Project's Telecom Address is the project's telecommunications identifier assigned by HUD. The first 5 characters after the Sender's Telecom Address must contain

TENER Tenant MAT Error Record						
MAT Field	**Note**	**Field Name**	**Field Label (Now Included in Output)**	**Maximum Field Length**	**Field Type**	**Edits/Source/Results**
						"TRACM". The next 5 positions are the HUD assigned number. **(Formerly Mailbox ID)**
2		Record Identifier	Record ID:	5	Alphanumeric	Value: "TENER."
3		Release/Version Number	Release/Version:	7	Alphanumeric	Value must equal: "2.0.2.C." TRACS Release = 2.0.2. TRACS Version = C
4		Record Number	Record Number:	5	Numeric	A sequential number beginning with 00001 for the first record in this transmission and incremented by 1 for each subsequent record in this transmission.
5		Original Date Stamp	Original Date:	8	Date	MMDDYYYY – The date stamp of the original transmission to which these error records apply.
6		Original Time Stamp	Original Time:	6	Time	HHMMSS – The time stamp of the original transmission to which these error records apply.
7		Tenant Number	Tenant Number:	10	Alphanumeric	If field #8 contains the value "MAT10," then this is the tenant number, which was sent with the 50059 in error. The value is left justified and space filled.
8		Record Type Error	Record Type Error:	5	Alphanumeric	Contains the MAT record type in error such as "MAT10" for an error in a 50059.
9		Record Section Error	Record Section Error:	1	Alphanumeric	Contains the section in which the error occurred if this record type has sections, otherwise leave blank.
10		Record in Error Record Number	Record in Error:	5	Numeric	Contains the sequential record number of the record in error.
11		Field Number in Error	Field Number in Err:	4	Numeric	Contains the field number of the field within the record that has the error.
12		Field Contents in Error	Field Content in Err:	50	Alphanumeric	Contains the field contents in error. Field contents are truncated after 50 characters. In some cases this field may

TENER Tenant MAT Error Record						
MAT Field	**Note**	**Field Name**	**Field Label (Now Included in Output)**	**Maximum Field Length**	**Field Type**	**Edits/Source/Results**
						contain a message instead of field contents. This message will be prefixed by "MSG;" for example, "MSG: MISSING HEAD OF HOUSEHOLD."
13		Type Field Error	Type Field Error:	2	Alphanumeric	Values: C, D, F, H, N, P, T, X,, A1, A2, A3, A4, A5, A6, A7, A8, A9 or 1 Space = not field error See Appendix C of the MAT User Guide for associated message.
14		Type Mandatory Error	Type Mandatory Err:	2	Alphanumeric	Values: G, J, K, L, M, S, V, Z, 2, 3, 4, 5, 6, or 9 Space = not mandatory error See Appendix C of the MAT User Guide for associated message.
15		Transmission Record Count Error	Trans Rec Cnt Err:	2	Alphanumeric	Values: E, O, Q, R or 7 Space = not a count or sequence error See Appendix C of the MAT User Guide for associated message.
16		Site Reported Count	Site Rptd Count:	6	Numeric	If field #15 contains "E" or "Q," this will be the site reported value.
17		MAT Calculated Count	MAT Calculated Count:	6	Numeric	If field #15 contains "E" or "Q," this will be the MAT calculated value. (For example, field #12 in TENHR contains the number of certifications (MAT10s) in this transmission. If the site reports 20 MAT10s and the MAT counts only 19 MAT10s, then field #16 in this record (TENER) will contain 20 and field #17 will contain 19).

TENER Tenant MAT Error Record						
MAT Field	**Note**	**Field Name**	**Field Label (Now Included in Output)**	**Maximum Field Length**	**Field Type**	**Edits/Source/Results**
18		Error Message Text	Error Message:	78	Alphanumeric	This field contains the error message text that is associated with an error code. See Appendix C of the MAT User Guide for associated message.

The following is an example of a TENER:

```
Posted: Wed, 16 Dec 2009  20:01:12 -0500 (EST)
From:   TRACMPROD
To:     TRACM00000
Subj:   TRACS Response Messages and/or Errors

TRACM02528

HUD CFS TRACS DATA 000000 000000

@*@ TRACM00000TRACM00000
Record ID: TENER
Release/Version: 2.0.2.C
Record Number: 00001
Original Date: 12162009
Original Time: 051114
Tenant Number:
Record Type Error: TENHR
Record Section Error:
```

```
Record in Error: 09999
Field Number in Err: 0023
Field Content in Err:
Type Field Error: A3
Type Mandatory Err:
Trans Rec Cnt Err:
Site Rptd Count:
MAT Calculated Count:
Error Message: TRANSMISSION REJECTED: Project Number Required
```

4.4.2 Voucher MAT Error Record (VCHER)

The Voucher MAT Error Record (VCHER) is being reformatted to allow for easier readability. The new format of the VCHER is as follows:

VCHER Voucher MAT Error Record						
MAT Field	**Note**	**Field Name**	**Field Label**	**Maximum Field Length**	**Field Type**	**Edits/Source/Results**
				Note: M = Mandatory		
1	**M**	Processing Mailbox ID, Filler, and Project's Telecom Address	N/A	24	Alphanumeric	Processing Mailbox ID value: @*@ Sender's Telecom Address has been discontinued. TRACS obtains this information from the TRACSMail Header. All messages related to the transmission are returned to this address. The filler is 10 characters after the "@*@" (not including spaces). Project's Telecom Address is the project's

VCHER Voucher MAT Error Record						
MAT Field	**Note**	**Field Name**	**Field Label**	**Maximum Field Length**	**Field Type**	**Edits/Source/Results**
						telecommunications identifier assigned by HUD. The first 5 characters after the Sender's Telecom Address must contain "TRACM". The next 5 positions are the HUD assigned number. **(Formerly Mailbox ID)**
2		Record Identifier	Record ID:	5	Alphanumeric	Value: "VCHER."
3		Release/Version Number	Release/Version:	7	Alphanumeric	Value must equal: "2.0.2.C" TRACS Release = 2.0.2. TRACS Version = C
4		Record Number	Record Number:	5	Numeric	A sequential number beginning with 00001 for the first record in this transmission and incremented by 1 for each subsequent record in this transmission.
5		Original Date Stamp	Original Date:	8	Date	MMDDYYYY – The date stamp of the original transmission to which these error records apply.
6		Original Time Stamp	Original Time:	6	Time	HHMMSS – The time stamp of the original transmission to which these error records apply.
7		Tenant Number	Tenant Number:	10		Blank
8		Record Type Error	Record Type Error:	5	Alphanumeric	Value: "MAT30," "MAT31," "VCHHR" or "VCHND."
9		Record Section Error	Record Section Error:	1	Alphanumeric	Contains the section in which the error occurred if this record type has sections, otherwise leave blank.

VCHER Voucher MAT Error Record						
MAT Field	**Note**	**Field Name**	**Field Label**	**Maximum Field Length**	**Field Type**	**Edits/Source/Results**
10		Record In Error Record Number	Record in Error:	5	Numeric	Contains the sequential record number of the record in error.
11		Field Number In Error	Field Number in Err:	4	Numeric	Contains the field number of the field within the record that has the error.
12		Field Contents In Error	Field Content in Err:	50	Alphanumeric	Contains the field contents in error. Field content is truncated after 50 characters. In some cases this field may contain a message instead of field contents. "MSG" will prefix this message.
13		Type Field Error	Type Field Error:	2	Alphanumeric	Values: D, F, N, P, T, X, , A1, A2, A3, A4, A5, A6, A7, A8, A9, or V1 Space = not field error See Appendix C of the MAT User Guide for associated message.
14		Type Mandatory Error	Type Mandatory Err:	2	Alphanumeric	Values: K, S, V, Z, V2, V4, OR 2 Space = not mandatory error See Appendix C of the MAT User Guide for associated message.
15		Transmission Record Count Error	Trans Rec Cnt Err:	2	Alphanumeric	Values: E, Q, R, W, VO, V3 or V7 or V1 Space = not a count or sequence error See Appendix C of the MAT User Guide for associated message.

VCHER Voucher MAT Error Record						
MAT Field	**Note**	**Field Name**	**Field Label**	**Maximum Field Length**	**Field Type**	**Edits/Source/Results**
16		Site Reported Count	Site Rptd Count:	6	Numeric	If field #15 contains "E" or "Q," this will be the site reported value.
17		MAT Calculated Count	MAT Calculated Count:	6	Numeric	If field #15 contains "E" or "Q," this will be the MAT calculated value. (For example, field #12 in VCHHR contains the number of vouchers (MAT30s) in this transmission. If the site reports 20 MAT30s and the MAT counts only 19 MAT30s, then field #16 in this record (VCHER) will contain 20 and field #17 will contain 19).
18		Error Message Text	Error Message:	78	Alphanumeric	This field contains the error message text that is associated with an error code. The error codes and associated messages are defined in an Appendix of the MAT User Guide.

The following is an example of a VCHER:

```
Posted: Wed, 09 Dec 2009   08:00:11 -0500 (EST)
From:   TRACMTEST
To:     TRACM00000
Subj:   TRACS Response Messages and/or Errors

TRACM00000

HUD CFS TRACS DATA 000000 000003

@*@ TRACM00000TRACM00001
Record ID: VCHER
```

```
Release/Version: 2.0.2.C
Record Number: 00001
Original Date: 12082009
Original Time: 172259
Tenant Number:
Record Type Error: VCHHR
Record Section Error: 9
Record in Error: 09999
Field Number in Err: 0026
Field Content in Err:
Type Field Error: A4
Type Mandatory Err:
Trans Rec Cnt Err:
Site Rptd Count: 009999
MAT Calculated Count: 009999
Error Message: TRANSMISSION REJECTED: Contract Number Not in TRACS
```

4.4.3 Tenant MAT Trailer Record (TENTR)

The Tenant MAT Trailer Record (TENTR) is being reformatted to allow for easier readability. The new format of the TENTR with errors is as follows:

TENTR Tenant MAT Trailer Record						
MAT Field	**Note**	**Field Name**	**Field Label**	**Maximum Field Length**	**Field Type**	**Edits/Source/Results**
Note: M = Mandatory						
1	**M**	Processing Mailbox ID,	N/A	24	Alphanumeric	Processing Mailbox ID value: @*@

TENTR Tenant MAT Trailer Record						
MAT Field	**Note**	**Field Name**	**Field Label**	**Maximum Field Length**	**Field Type**	**Edits/Source/Results**
		Sender's Telecom Address, and Project's Telecom Address				Sender's Telecom Address is the telecommunications identifier assigned by HUD to the sender submitting the data to TRACS. The first 5 characters (not including spaces) after "@*@" must contain "TRACM". The next 5 positions are the HUD assigned number. **(Formerly Mailbox ID)** Project's Telecom Address is the project's telecommunications identifier assigned by HUD. The first 5 characters after the Sender's Telecom Address must contain "TRACM". The next 5 positions are the HUD assigned number. **(Formerly Mailbox ID)**
2		Record Identifier	Record ID:	5	Alphanumeric	Value: "TENTR"
3		Release/Version Number	Release/Version:	7	Alphanumeric	Value must equal: "2.0.2.C." TRACS Release = 2.0.2. TRACS Version = C
4		Record Number	Record Number:	5	Numeric	A sequential number beginning with 00001 for the first record in this transmission and incremented by 1 for each subsequent record in this transmission.
5		Original Date Stamp	Original Date:	8	Date	MMDDYYYY – The date stamp of the original transmission to which these error records apply.
6		Original Time Stamp	Original Time:	6	Time	HHMMSS – The time stamp of the original transmission to which these error records apply.
7		Error Date Stamp	Error Date:	8	Date	MMDDYYYY – The date stamp of this transmission.
8		Error Time Stamp	Error Time:	6	Time	HHMMSS – The time stamp of this transmission, not the actual time transmission occurred.

TENTR Tenant MAT Trailer Record						
MAT Field	**Note**	**Field Name**	**Field Label**	**Maximum Field Length**	**Field Type**	**Edits/Source/Results**
9		OA-Defined Data	OA Defined Data:	20	Alphanumeric	The same value as contained in the TENHR field #6.
10		Sender Name	Sender Name:	15	Alphanumeric	Sender's name.
11		Sender Street Address	Sender Address:	20	Alphanumeric	Sender's address.
12		Sender City	Sender City:	15	Alphanumeric	Sender's city.
13		Sender State	Sender State:	2	Alphanumeric	Sender's state.
14		Sender Zip Code	Sender Zip:	5	Numeric	Sender's zip code.
15		Total Number Error Records	Total Error Recs:	6	Numeric	The total number of type TENER records sent.
16		Total Number of Field Errors	Total Field Err:	6	Numeric	The total number of field edit errors.
17		Total Number of Mandatory Errors	Total Mandatory Err:	6	Numeric	The total number of mandatory field errors.
18		Total Number of Record Count Errors	Total Rec Cnt Err:	6	Numeric	The total number of record count errors.
19		OA Software Vendor	OA Software Vendor:	20	Alphanumeric	Name of the software product used by the OA to create this submission.
20		OA Software Release/Version	OA Software Rel/Ver:	10	Alphanumeric	The release or version number associated with the software used by the OA to create this submission.
21		CA Software Vendor	CA Software Vendor:	20	Alphanumeric	Name of the software product used by the CA or third-party to create this submission.
22		CA Software	CA Software	10	Alphanumeric	The release or version number associated with the software

TENTR Tenant MAT Trailer Record						
MAT Field	**Note**	**Field Name**	**Field Label**	**Maximum Field Length**	**Field Type**	**Edits/Source/Results**
		Release/Version	Rel/Ver:			used to create this file.
23		Agency Defined Data	Agency Defined Data:	20	Alphanumeric	Data defined by the CA or other entities receiving submissions and forwarding them to TRACS.
24		Response Message Text	Response Message:	45	Alphanumeric	Value: “NO ERRORS DETECTED IN THIS MAT SUBMISSION” or “<#OF> ERRORS DETECED IN THIS MAT SUBMISSION”

The following is an example of a TENTR with errors:

```
@*@ TRACM00000TRACM00000
Record ID: TENTR
Release/Version: 2.0.2.C
Record Number: 00001
Original Date: 12162009
Original Time: 051117
Error Date: 12162009
Error Time: 180518
OA Defined Data: 1-11111
Sender Name: ABC Corp
Sender Address: PO BOX 1111
Sender City: Anywhere
Sender State: TX
Sender Zip: 11111
Total Error Recs: 000005
Total Field Err: 000001
```

```
Total Mandatory Err: 000001
Total Rec Cnt Err: 000003
OA Software Vendor: ABC Corp
OA Software Rel/Ver: V 1.1
CA Software Vendor:
CA Software Rel/Ver:
Agency Defined Data:
Response Message: 5 ERRORS DETECTED IN THIS MAT SUBMISSION
```

The following is an example of a TENTR without errors:

```
@*@ TRACM00000TRACM00000
Record ID: TENTR
Release/Version: 2.0.2.C
Record Number: 00001
Original Date: 12162009
Original Time: 051117
Error Date: 12162009
Error Time: 180518
OA Defined Data: 1-11111
Sender Name: ABC Corp
Sender Address: PO BOX 1111
Sender City: Anywhere
Sender State: TX
Sender Zip: 11111
Total Error Recs: 000000
Total Field Err: 000000
Total Mandatory Err: 000000
Total Rec Cnt Err: 000000
OA Software Vendor: ABC Corp
OA Software Rel/Ver: V 1.1
```

```
CA Software Vendor:
CA Software Rel/Ver:
Agency Defined Data:
Response Message: NO ERRORS DETECTED IN THIS MAT SUBMISSION
```

4.4.4 Voucher MAT Trailer Record (VCHTR)

The Voucher MAT Trailer Record (VCHTR) is being reformatted to allow for easier readability. The new format of the VCHTR with errors is as follows:

VCHTR Voucher MAT Trailer Record						
MAT Field	**Note**	**Field Name**	**Field Label**	**Maximum Field Length**	**Field Type**	**Edits/Source/Results**
				Note: M = Mandatory		
1	**M**	Processing Mailbox ID, Filler, and Project's Telecom Address	N/A	24	Alphanumeric	Processing Mailbox ID value: @*@ Sender's Telecom Address has been discontinued. TRACS obtains this information from the TRACSMail Header. All messages related to the transmission are returned to this address. The filler is 10 characters after the "@*@" (not including spaces). Project's Telecom Address is the project's telecommunications identifier assigned by HUD. The first 5 characters after the Sender's Telecom Address must contain "TRACM". The next 5 positions are the HUD assigned number. **(Formerly Mailbox ID)**

VCHTR Voucher MAT Trailer Record						
MAT Field	**Note**	**Field Name**	**Field Label**	**Maximum Field Length**	**Field Type**	**Edits/Source/Results**
2		Record Identifier	Record ID:	5	Alphanumeric	Value: “VCHTR”
3		Release/Version Number	Release/Version:	7	Alphanumeric	Value must equal: “2.0.2.C.” TRACS Release = 2.0.2. TRACS Version = C
4		Record Number	Record Number:	5	Numeric	A sequential number beginning with 00001 for the first record in this transmission and incremented by 1 for each subsequent record in this transmission.
5		Original Date Stamp	Original Date:	8	Date	MMDDYYYY – The date stamp of the original transmission to which these error records apply.
6		Original Time Stamp	Original Time:	6	Time	HHMMSS – The time stamp of the original transmission to which these error records apply.
7		Error Date Stamp	Error Date:	8	Date	MMDDYYYY – The date stamp of this transmission.
8		Error Time Stamp	Error Time:	6	Time	HHMMSS – The time stamp of this transmission, not the actual time transmission occurred.
9		OA Defined Data	OA Defined Data:	20	Alphanumeric	The same value as contained in the VCHHR field #6.
10		Sender Name	Sender Name:	15	Alphanumeric	Sender's name.
11		Sender Street Address	Sender Address:	20	Alphanumeric	Sender's address.
12		Sender City Name	Sender City:	15	Alphanumeric	Sender's city.

VCHTR Voucher MAT Trailer Record						
MAT Field	**Note**	**Field Name**	**Field Label**	**Maximum Field Length**	**Field Type**	**Edits/Source/Results**
13		Sender State	Sender State:	2	Alphanumeric	Sender's state.
14		Sender Zip Code	Sender Zip:	5	Numeric	Sender's zip code.
15		Total Number Error Records	Total Error Recs:	6	Numeric	The total number of type VCHER records sent.
16		Total Number of Field Errors	Total Field Err:	6	Numeric	The total number of field edit errors.
17		Total Number of Mandatory Errors	Total Mandatory Err:	6	Numeric	The total number of mandatory field errors.
18		Total Number of Record Count Errors	Total Rec Cnt Err:	6	Numeric	The total numbers of record count errors.
19		OA Software Vendor	OA Software Vendor:	20	Alphanumeric	Name of the software product used by the OA to create this submission.
20		OA Software Release/Version	OA Software Rel/Ver:	10	Alphanumeric	The release or version number associated with the software used by the OA to create this submission.
21		CA Software Vendor	CA Software Vendor:	20	Alphanumeric	Name of the software product used by the CA to create this submission.
22		CA Software Release/Version	CA Software Rel/Ver:	10	Alphanumeric	**Mandatory for CA or other entities receiving submissions and forwarding them to TRACS.** The release or version number associated with the software used to create this submission.
23		Agency Defined Data	Agency Defined Data:	20	Alphanumeric	Data defined by CA or other entities receiving submissions and forwarding them to TRACS**.**

VCHTR Voucher MAT Trailer Record						
MAT Field	**Note**	**Field Name**	**Field Label**	**Maximum Field Length**	**Field Type**	**Edits/Source/Results**
24		Response Message Text	Response Message:	45	Alphanumeric	Value: “NO ERRORS DETECED IN THIS MAT SUBMISSION” or “<#OF> ERRORS DETECED IN THIS MAT SUBMISSION”

The following is an example of a VCHTR with errors:

```
@*@ TRACM00000TRACM00001
Record ID: VCHTR
Release/Version: 2.0.2.C
Record Number: 00002
Original Date: 10082009
Original Time: 172252
Error Date: 10092009
Error Time: 071645
OA Defined Data: 1-11111
Sender Name: ABC Corp
Sender Address: PO BOX 1111
Sender City: Anywhere
Sender State: TX
Sender Zip: 11111
Total Error Recs: 000005
Total Field Err: 000001
Total Mandatory Err: 000001
Total Rec Cnt Err: 000003
OA Software Vendor: ABC Corp
```

```
OA Software Rel/Ver: V 1.1
CA Software Vendor:
CA Software Rel/Ver:
Agency Defined Data:
Response Message: 5 ERRORS DETECTED IN THIS MAT SUBMISSION
```

The following is an example of a VCHTR without errors:

```
@*@ TRACM00000TRACM00001
Record ID: VCHTR
Release/Version: 2.0.2.C
Record Number: 00002
Original Date: 10082009
Original Time: 172252
Error Date: 10092009
Error Time: 071645
OA Defined Data: 1-11111
Sender Name: ABC Corp
Sender Address: PO BOX 1111
Sender City: Anywhere
Sender State: TX
Sender Zip: 11111
Total Error Recs: 000000
Total Field Err: 000000
Total Mandatory Err: 000000
Total Rec Cnt Err: 000000
OA Software Vendor: ABC Corp
OA Software Rel/Ver: V 1.1
CA Software Vendor:
CA Software Rel/Ver:
```

Agency Defined Data:
Response Message: NO ERRORS DETECTED IN THIS MAT SUBMISSION
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